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NORTH DAKOTA STATE ELECTRICAL BOARD SINCE 1917

Ensuring Public Safety Since 1917

Connections

Issue 260
May 2019

A Message From the Executive Director:

Hello, everyone!

I hope everyone is dug out from this past winter and we can get on with spring!

I've been writing about the power limited technician (PLT) license for a few of the past newsletters. If you have not heard, Senate Bill 2359 which dealt with the PLT, was turned into a legislative study. There was a House Bill 1157 that was amended to take the good components from SB 2359 to end up with some type of power limited electrician license (PLE).

By administrative rule process, the Board will come up with rules to further define the scope of the PLE. I want to thank all that drove long distances and that took the time to come out to support SB 2359 and also the committee that worked for the past three years on the scope of what power limited licensing should look like for North Dakota.

A Board-sponsored Senate Bill 2056 passed with an emergency clause. It was signed by Governor Burgum and has now become ND law. The Board still needs to promulgate rules to further define the scope of the new law. The bill was a house-keeping issue to reword 43 -11-09 2b(1) to allow the board to be the entity that approves related training programs in the industry that it regulates. We held true to our word and have let the individuals affected by this old law take their exam in our office.

Also, this bill gives the board authority to expend funds to promote and educate about the electrical trade. We have had several discussions on ways to accomplish this and there will be lots of work to do on it so if you have ideas, send them in!

When SB 2056 had its first committee hearing, an overwhelming crowd of industry persons showed up. I counted 51 persons that showed some sort of support either by sharing with the committee their personal stories or just showing support by being present. It all went well and we thank each and every one of you who took the time to either be present or by sending messages of support. Thanks - we all did this together!!

We would like to send a special thank you to Senator Jordan Kannianen, who is also an electrical contractor, for being the primary sponsor of SB 2056 and SB 2359. Senator Kannianen did an excellent job of explaining the benefits of each of the two Senate bills to the committee. Thanks again Jordan!!!

Hope you are having a great spring and safe travels!!

- James Schmidt

LEGISLATURE PASSES SENATE BILL 2056 – EDUCATION BILL BECOMES ND LAW

EDUCATION BILL - NDCC 43-09-11

In NDCC 43-09-11-2b(1) – The proposed bill changed the verbiage "federal bureau of apprenticeship and training" to "the board". The intent will now allow the Board to approve apprenticeship training programs without the involvement of the United States department of labor.

The Board will follow-up on this law change through administrative rules to define electrical education rules and create an education committee that would set up minimum education guidelines/curriculum for electrical apprenticeship education. This committee may also review continuing education, both classroom and online, plus explore other electrical educational opportunities.

Also, the Board sought authority to "expend funds to educate and encourage potential electricians into the trade". This will allow the Board to promote the trade and the possibilities that have been discussed including visiting with students about the trade, supporting high school industrial arts (shop) programs, and possibly offering an electrical scholarship to an area college or an apprenticeship program.

Governor Doug Burgum signs Senate Bill 2056 into law on March 6, 2019. Attending the signing were (back row, left to right) NDSEB Administrative Assistant Janel Redinger, NDSEB Administrative Assistant Ashley Windhorst, NDSEB Director of Inspections Doug Grinde, and NDSEB Office Manager Paula Glass. Front row: ND Senator Jordan Kannianen, Governor Burgum, and NDSEB Executive Director James Schmidt.

The Board plans to work through ND Career and Technical Education (CTE) to come up with potential ways to reach out to the younger and any other generation to encourage them to enter the electrical field. There will be more to come on this issue. Ø

Inside This Issue . . .

IN MEMORY OF RICHARD FLURER, FORMER BOARD MEMBER FOR THE N.D. STATE ELECTRICAL BOARD

Richard Flurer, 85, Tempe, AZ, died December 3, 2018. Richard was a Board Member for the North Dakota State Electrical Board from 1989 to 1999. He represented a master electrician who was a contractor. We appreciated the time he spent as a board member and will be missed. We wish to express our deepest sympathy to his wife, family and friends.

SAFETY CORNER: OVERCURRENT PROTECTION - TRANSFORMER SECONDARY CONDUCTORS

We will continue our discussion on overcurrent protection by covering the requirements for protecting the secondary conductors of transformers found in NEC 240.21(C).

We need to remember the rules in Article 240.21(C) are for the protection of the conductors. The rules for protecting transformers are found in Article 450, and rules for protecting loads supplied by the transformer will be found in the article for the type of load supplied.

One very important thing to be aware of is that for transformer secondary conductors 240.4(B) is not permitted. You can't round up to the next standard size overcurrent device. Also be aware that 240.4(F) tells us that transformer secondary conductors shall not be considered to be protected by the primary overcurrent device unless they meet specific conditions. 408.36(B) also requires a panel board that is supplied through a transformer have the overcurrent protection located on the secondary side of the transformer except when meeting the requirement of the exception.

When selecting conductors for the secondary of a transformer installation, the NEC has six options to determine the ampacity of those conductors. To determine the rating of the conductor, choose the option that fits your installation and verify you meet all of the requirements.

(C)(1) Permits the secondary conductors of a single phase two wire secondary, or a three phase three wire delta connected secondary to be protected by the overcurrent protection on the primary side of the transformer. You must meet the requirement of 450.3 and also make sure the overcurrent protection is not greater than the value determined by multiplying the secondary conductor ampacity by the secondary-to-primary voltage ratio. The second paragraph clearly informs us that the secondary conductors of transformers other than the two types allowed in paragraph one are not considered to be protected by a primary side overcurrent device.

(C)(2) Gives the ampacity requirements for transformer secondary conductors that are not longer than 10 feet, there are four requirements and all must be followed when selecting these conductors. For example they must be sized for the calculated load and the supplied overcurrent device(s), not leave the equipment they supply, be protected by a raceway and meet the ratio requirements found in the fourth section.

(C)(3) Can be applied at an industrial installation where the secondary conductors are not over 25 feet long and they supply only switchgear or switchboards. Again there are four requirements that must be met, including servicing by qualified personnel and protection from physical damage, as well as having an ampacity not less than the secondary current rating of the transformer and the sum of the overcurrent devices.

(C)(4) Would apply when the conductors are installed outside of the building, in this case the conductors must terminate in a single overcurrent device that limits the load to the ampacity of the secondary conductors. These conductors have requirements similar to those for service conductors such as the overcurrent protection and disconnect must be grouped, and the load connection disconnect must be readily accessible and located outside or inside nearest point of entrance of the conductors.

(C)(5) Refers you back to 240.21(B)(3) for a feeder tapped transformer where the sum of the overall length of both the primary and secondary conductors does not exceed 25 feet total.

(C)(6) Applies for installations where the secondary conductors are not over 25 feet long, and again must comply with all of the requirements listed. These include an ampacity based on the voltage ratio multiplied by the primary overcurrent protection, termination in a single overcurrent device, and physical protection of the conductors.

To sum up, when installing transformers we need to be sure to protect the transformer, the conductors and the load, and be sure they will provide safe, trouble-free operation for the life of our installation. Transformers are permitted to have their overcurrent protection sized in accordance with Article 450.3 in part to compensate for inrush currents, so we must apply the rules in Article 240 to protect the conductors associated with the installation. Ø

Congratulations!

We Appreciate Your Years of Service and Dedication to the Board!

David Paul (District 6 Inspector) – 10 Years of Service

Doug Grinde (Director of Inspections) – 5 Years of Service

Leo Floer (District 4 Inspector) – 5 Years of Service

Greg Rockstad (District 5 Inspector) – 5 Years of Service

Kendrick Kjorsvik (District 10 Inspector) – 5 Years of Service

David Jaeger (District 12 Inspector) – 5 Years of Service

A Word from the Director of Inspections . . .

Here are a few thoughts as we head into spring . . .

INSPECTIONS: I have been talking to a few Electrical Engineers around the state, and they all seem to think 2019 is going to be a busy year for construction and electrical projects, so I would like to remind everyone to remember to get your wiring certificates filed **before** work commences. Please call the inspector in your area if you would like a rough-in or periodic inspection at any time - we will do our best to get there before the sheetrocking begins.

Some of our inspectors cover a large area, so please try and give us ample notice for any requested inspections. It would also help both the inspector and the electrical contractor if we could do a final inspection BEFORE occupancy of a house or business. It makes the inspection much easier, and if there are any corrections, it will be easier for you to make the corrections.

ELECTRIC VEHICLES: I was recently at a meeting at one of the electrical co-op's in North Dakota and one of the topics was electric vehicles and some of the incentives co-ops are offering for installing charging stations.

Remember to look at NEC 625.41 as this may have an impact on the existing service after you multiply the maximum load at 125%. NFPA 70 also had an amendment after printing the NEC code books which added NEC 625.44(A) for portable equipment, and NEC 625.54 = all single phase receptacles installed for the connection of electric vehicle charging that are rated 150 volts to ground or less, and 50 amps or less shall have GFCI protection for personnel. There was also an addition of 625.56 = Receptacle enclosures. Please take a look at NEC 625 before you install these charging systems.

The NDSEB Electrical Inspectors are also going to be performing more re-inspections after correction reports are submitted to our office as being done, so please make sure ALL corrections are completed before submitting your report. If you need more time, call your inspector and he will be more than willing to work with you on a completion date.

Two violations that we have been finding during our inspections that can be costly, time consuming, and a problem to fix after the service is energized and a building or site is occupied are:

1) NEC 230.95 – Ground Fault Protection of Equipment . This requires GFPE for all services more than 150 volts to ground, but less than 1000 volts to ground and rated 1000 amps or more. The performance test for GFPE shall be performed when first installed on site.
2) NEC 240.87 – Arc Energy Reduction. If you are installing a service 1200 amps or larger, make sure you look at all the options in this code and be prepared to provide documentation from your supplier or a ND licensed Electrical Engineer if an energy -reducing maintenance switch is not installed. Neither of these corrections are fun for us to have to write, and definitely not fun to get if you are a contractor. NDSEB Inspectors would be more than happy to do inspections on any of your larger services prior to energizing and it would make it much easier to make any corrections if needed.

Here is to a busy and safe construction season for us all, and please feel free to call your inspector or this office for any questions you may have.

Doug Grinde

Making A Connection:

Director of Inspections Doug Grinde

Doug Grinde has been with the NDSEB for six years, three as an Electrical Inspector and currently as Director of Inspections. He previously worked as a Journeyman electrician, Project Foreman for a contractor in Grand Forks and then a Master electrician who co-owned and operated an electrical contracting business.

Originally from Park River, North Dakota, Grinde attended Moorhead Technical Institute. He has been married to Jane for 22 years and have a son named Jonah. Grinde also owns a 4-year-old golden doodle named Bauer.

Do you have a favorite memory or experience while working for the NDSEB? *Our inspectors meetings. Every other month the state and city inspectors meet and discuss code issues that they have encountered. I like hearing about the interesting questions they have been asked and discussing possible resolutions.*

Did you have a mentor or person that inspired you? *My dad who taught me to work hard and respect others and that family is the most important thing in life.*

What are your hobbies? *Playing poker, golfing, hunting, fishing and just hanging out on the river with family and friends.*

If you couldn't do your current job, what would you want to do instead? *Hunting/fishing guide or professional poker player.*

The best thing about North Dakota is . . . ? *The people and the wide range of topography in the State. I love driving thru a town where you do not know anyone and they wave at you anyway.*

What's your favorite TV show? *Yellowstone*

The best movie of all time is . . ? *Miracle and Tombstone* Ø